

CLAIMS:

1. A remote intelligent communication device comprising:
a card-thin housing including:
an upper surface;
a lower surface; and
at least one side extending between the upper surface and
the lower surface forming the card-thin housing, the side having visibly
perceptible information thereon; and
communication circuitry within the housing configured to at least
one of communicate and receive electronic signals.
2. The remote intelligent communication device according to
claim 1 wherein the housing comprises a substrate and an encapsulant.
3. The remote intelligent communication device according to
claim 2 wherein the substrate comprises the upper surface and the
encapsulant comprises the lower surface.
4. The remote intelligent communication device according to
claim 1 wherein the card-thin housing has a thickness less than about
100 mils.

1 5. The remote intelligent communication device according to
2 claim 1 further comprising a processor within the card-thin housing and
3 coupled with the communication circuitry.

4
5 6. A radio frequency identification device comprising:
6 a housing including:
7 an upper surface;
8 a lower surface; and
9 at least one side intermediate the upper surface and the
10 lower surface, the side having visibly perceptible information thereon;
11 and
12 communication circuitry within the housing and the communication
13 circuitry being configured to at least one of communicate and receive
14 electronic signals.

15
16 7. The radio frequency identification device according to
17 claim 6 wherein the visibly perceptible information comprises
18 identification indicia of the radio frequency identification device.

19
20 8. The radio frequency identification device according to
21 claim 6 wherein the visibly perceptible information is less than about
22 ~~50 mils in height.~~

1 9. The radio frequency identification device according to
2 claim 6 wherein the communication circuitry comprises transponder
3 circuitry.

4
5 10. The radio frequency identification device according to
6 claim 6 wherein the housing comprises a substrate and an encapsulant.

7
8 11. The radio frequency identification device according to
9 claim 10 wherein the visibly perceptible information is provided on the
10 encapsulant.

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12 12. The radio frequency identification device according to
13 claim 6 further comprising a power source within the housing and
14 coupled with the communication circuitry.

15
16 13. A card comprising:
17 an upper surface;
18 a lower surface;
19 at least one side intermediate the upper and lower surfaces and
20 having a thickness less than about 100 mils; and
21 identification indicia on the side.

22
23 14. The card according to claim 13 wherein the identification
24 ~~indicia is less than about 50 mils in height.~~

1 15. The card according to claim 13 wherein the identification
2 indicia identifies the card.

3
4 16. The card according to claim 13 wherein the identification
5 indicia comprises at least one of a manufacturing date of the card and
6 a lot number.

7
8 17. The card according to claim 13 wherein the card has a
9 thickness less than about 100 mils.

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11 18. The card according to claim 13 further comprising:
12 transponder circuitry intermediate the upper and lower surfaces;
13 and

14 a processor intermediate the upper and lower surfaces and
15 ~~coupled with the transponder circuitry.~~

19. A communication device comprising:
a substrate having a support surface;
an antenna on the support surface;
transponder circuitry coupled with the antenna;
a battery in electrical connection with the transponder circuitry;
a cured resin upon the support surface, the antenna, the
transponder circuitry and the battery, the cured resin and substrate
forming a housing having an upper surface and a lower surface
interconnected by side surfaces; and
identification indicia on at least one of the side surfaces of the
housing.

20. The communication device according to claim 19 wherein the
housing has a thickness less than about 100 mils.

21. The communication device according to claim 19 wherein the
identification indicia is provided on the resin.

22. The communication device according to claim 19 further
comprising a processor within the housing and coupled with the
transponder circuitry.

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23. A method of forming a card comprising:
providing a substrate having:
an upper surface;
a lower surface, and the upper and lower surfaces
individually having a length and a width; and
a plurality of sides individually having a thickness less than
the lengths and the widths of the surfaces; and
encoding visibly perceptible information on at least one of the
sides.

24. The method of forming a card according to claim 23
wherein the thickness of the card is less than about 100 mils.

25. The method of forming a card according to claim 23
wherein the visibly perceptible information comprises identification
indicia.

26. The method of forming a card according to claim 23 further
~~comprising incorporating transponder circuitry with~~ the substrate.

1 27. A method of forming a card comprising:
2 providing a card including an upper surface, a lower surface and
3 a plurality of sides;
4 providing a print head;
5 moving at least one of the card and the print head relative to
6 the other of the card and print head; and
7 using the print head, encoding visibly perceptible information on
8 at least one side of the card.

9
10 28. The method of forming a card according to claim 27
11 wherein the encoding is provided during the moving.

12
13 29. The method of forming a card according to claim 27
14 wherein the visibly perceptible information comprises identification
15 indicia.

16
17 30. The method of forming a card according to claim 27 further
18 comprising forming transponder circuitry within the card prior to the
19 encoding.

1 31. A method of forming a communication device comprising:
 2 providing a first substrate;
 3 providing an antenna supported by the first substrate;
 4 coupling communication circuitry with the antenna on the first
 5 substrate;

6 applying and curing an encapsulant over the first substrate to
 7 form a composite substrate including the first substrate and the
 8 encapsulant, the composite substrate having upper and lower surfaces
 9 and at least one side surface extending therebetween; and
 10 encoding visibly perceptible information on the side surface.

11
 12 32. The method of forming a communication device according
 13 to claim 31 wherein the encoding comprises encoding the visibly
 14 perceptible information on the encapsulant.

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 16 33. The method of forming a communication device according
 17 to claim 31 wherein the visibly perceptible information comprises
 18 ~~identification indicia.~~

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1 34. A method of forming a remote intelligent communication
2 device comprising:

3 providing a substrate;

4 forming communication circuitry upon the substrate and configured
5 to at least one of communicate and receive electronic signals;

6 encapsulating the communication circuitry thereby forming a card-
7 thin housing with the substrate, the housing including an upper surface,
8 a lower surface, and at least one side extending between the upper and
9 lower surfaces; and

10 encoding visibly perceptible information on the side of the card-
11 thin housing.

12
13 35. The method of forming a remote intelligent communication
14 device according to claim 34 wherein the communication circuitry
15 comprises a power source.

16
17 36. The method of forming a remote intelligent communication
18 device according to claim 34 wherein the card-thin housing has a
19 thickness less than 100 mils.

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21 37. The method of forming a remote intelligent communication
22 device according to claim 34 wherein the visibly perceptible information
23 ~~comprises identification indicia.~~

1 38. The method of forming a remote intelligent communication
2 device according to claim 37 wherein the communication circuitry
3 comprises transponder circuitry configured to generate an identification
4 signal corresponding to the identification indicia.

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6 39. A method of forming a communication device comprising:
7 providing a substrate;
8 supporting an antenna on the substrate;
9 coupling transponder circuitry with the antenna;
10 mounting a battery to the substrate in electrical connection with
11 the transponder circuitry;
12 encapsulating the antenna, the transponder circuitry, the battery
13 and at least a portion of the substrate with a flowable encapsulant;
14 curing the flowable encapsulant on the substrate into a solid
15 housing having an upper surface and lower surface interconnected by
16 side surfaces defining a housing thickness; and
17 encoding identification indicia on at least one of the side surfaces
18 of the housing.

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20 40. The method of forming a communication device according
21 to claim 39 wherein the encoding comprises encoding the identification
22 ~~indicia on the encapsulant.~~

1 41. The method of forming a communication device according
2 to claim 39 wherein the identification indicia identifies the
3 communication device.

4
5 42. A method of encoding visibly perceptible information on a
6 communication device comprising:

7 providing a card housing communication circuitry therein, the card
8 having upper and lower surfaces interconnected by side surfaces;

9 providing a print head;

10 supporting the card on one of the side surfaces;

11 moving the print head adjacent another side surface of the card;

12 and

13 encoding identification indicia on the another side surface of the
14 card with the moving print head.

15
16 43. The method of encoding visibly perceptible information on
17 a communication device according to claim 42 further comprising:

18 providing a plurality of said cards in a stack; and

19 printing on the card sides while the plurality of cards is in the
20 stack.

1 44. The method of encoding visibly perceptible information on
2 a communication device according to claim 42 further comprising:
3 providing a plurality of said cards in a pre-arranged orientation;
4 and
5 selecting one of the cards prior to the supporting.

6
7 45. The method of encoding visibly perceptible information on
8 a communication device according to claim 42 wherein the card has a
9 thickness less than about 100 mils.

10
11 46. A method of encoding visibly perceptible information on a
12 communication device comprising:

13 providing a card housing communication circuitry therein, the card
14 having upper and lower surfaces interconnected by side surfaces;

15 providing a print head;

16 moving the card relative to the print head; and

17 encoding identification indicia on at least one of the side surfaces
18 with the print head while moving the card relative to the print head.

19
20 47. The method of encoding visibly perceptible information on
21 a communication device according to claim 46 wherein the moving
22 comprises passing the card by the print head intermediate a pair of
23 driving processing rollers.
24

1 48. The method of encoding visibly perceptible information on
2 a communication device according to claim 46 wherein the card has a
3 thickness less than about 100 mils.

4
5 49. The method of encoding visibly perceptible information on
6 a communication device according to claim 46 wherein the print head
7 ~~remains stationary relative to the moving card during printing.~~

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9 Add A3
10 Add B4
11 Add C5
12 Add D1
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